Transportation News

A Resource for Military Transportation Engineers

Volume 14, January 1998

In This Issue

C-17 Criteria

The Air Force and Army have jointly authored a new Engineering Technical Letter (ETL) covering design, construction, maintenance and evaluation of contingency airfields for C-17 aircraft. The document is ETL 97-9, Criteria and Guidance for C-17 Contingency and Training Operations on Semi-Prepared Airfields. The ETL was published in electronic format only and can be down loaded from the Air Force Civil Engineering Support Agency (AFCESA) homepage (http://www.afcesa.af.mil/AFCESA/TechSupport/Energy/ETL/).

C-17 Aircraft

The results of initial field tests conducted with the aircraft at various sites are given in the ETL. Further testing and refinement are expected this year, resulting in various revisions to the ETL.

Information on training requirements for the aircraft are not contained in this version of the ETL. Training requirements will be included in the next revision available March 1998. If you need immediate information on the training requirements or on the latest changes in criteria for the C-17 contact B.J. Skar or Gainard Mattke, Transportation Systems Center, (402) 221-7262 or (402) 221-7263. See page 4 for C-17 testing and page 5 for other new transportation-relatedETLs.

Guide Specifications Numbers Change

The Corps' guide specification numbers are changing to be consistent with the Construction Specifications Institute (CSI). The Corps converted over to the CSI format a few years ago and now will be using the CSI numbering system. Huntsville Engineering and Support Center has converted some of the specifications, i.e. CEGS 02745, "Bituminous Surface Treatment," to the new numbering system. All specifications should have new numbers with in the next few months.

The Corps "Grading" specification has been combined with the "Earthwork for Roadways, Railroads, and Airfields" specification and will have the new number and title, CEGS 02300, "Earthwork". If you have changes to the earthwork or any paving specifications submit ENG FORM 3078 or contact the Transportation Systems Center (see last page for POCs).

NEW CONSTRUCTION MANAGEMENT SERVICES

The Transportation Systems Center is looking for a District needing Construction Management services. This is to cover the minimum guarantee of $20,000 for the URS Greiner contract. URS Greiner can be utilized to supplement the Corps' inspection staff on large paving projects. On smaller remote projects URS Greiner can be used to provide the government's full on-site management with reporting direct to the District's Contracting Officers Representative or Resident Engineer. The contract can also be used for quality assurance inspections and laboratory testing.

If you have a potential task order for URS Greiner, contact Dan Boyer at (402) 221-7266 or E-mail dan.j.boyer@usace.army.mil.

New Indefinite Delivery Type Contracts

The Transportation Systems Center has two new Fixed Price Indefinite Delivery Type Contracts for the design and evaluation of airfields and roadways with Crawford, Murphy, and Tilly, Inc. and Baker Transportation. Two additional contracts have been awarded for railroad and roadway design with HDR Engineering Inc. and Hanson Engineers. A separate contract is ready to be awarded with URS Greiner for Construction Management of Airfields and Roadways.

These contracts can be utilized by any Corps District or Laboratory. Contracting Officers Authority for a Task Order is transferred to the District or Laboratory using the contract. These contracts can be used by DPW staff by going through their local district. Each task order has a one million dollar limit.

The benefit of this type of contract is the time saved (approximately 16 week) by eliminating the Construction Business Daily (CBD) selection procedure and the Defense Contract Audit Agency (DCAA) audit. This time savings makes these contracts ideal for fast track O&M projects in support of the DPWs. These contracts also provide access to a consultant that specializes in transportation.

For more information on the contracts, contact Dan Boyer at (402) 221-7266 or E-mail dan.j.boyer@usace.army.mil.

Examples of How the TSMCX Can Help You

The TSMCX supported the Louisville District in evaluating the use of a state highway asphalt mix for an airfield pavement project at Ft Knox, Kentucky. Currently, the use of state highway specifications for airfield pavements is prohibited by regulation. Evaluation of the state mix design revealed that the natural sands content was too high and may have resulted in rutting of the airfield pavement . TSMCX recommended corrective adjustments to the state mix prior to allowing its use for airfield pavements.

The TSMCX supported the Savannah District with a QC review of the Arrival/Departure Airfield Control Group Staging Complex at Ft. Bragg. Recommendations were made to cold recycle existing pavements being removed into base materials for new construction. Changes identified for the rigid pavement design will extend the pavement life and reduce maintenance costs.

In 1995, the TSMCX assisted HQ 524 Corps Support Battalion in evaluating existing airfield facilities at Wheeler AAF, Hawaii. The CH-47 (Chinook) helicopters were being relocated from Barbers Point Naval Air Station as a result of BRAC. At that time, the TSMCX recommended reconstruction of an existing apron and taxiway, provided a temporary parking plan for existing pavement, and provided a permanent parking plan for a new apron. The TSMCX also recommended that the installation and MAJCOM pursue funding for these projects from the Navy's base closure funds. In the report, Base Realignment and Closure Construction Requirements, dated 12 Novemenber 1997, the U. S. Army Audit Agency used the TSMCX recommendations and determined that $7.7 M of the improvements should be funded from the Navy's base closure fund to reconstruct a new apron and taxiway.

The Transportation Systems Center provided assistance to the Army's Space and Strategic Defense Command (USASSDC) regarding Wake Island Airfield. USASSDC is interested in obtaining waivers to criteria regarding pavements types used on the airfield to reduce project costs. The TSMCX provided the necessary information on the airfield waiver procedures and technical input for waiver justification.

What's Happening with PCASE in '98

1998 will be an exciting year for the Pavement-Transportation Computer Assisted Structual Engineering (PCASE). New and innovative changes are in-line for some of the existing computer programs. All changes have been requested by you, the user. If there is something on your wish list that is missing from the list below contact Mary Adolf, Transportation Systems Center, (402) 221-7265.

Computer programs to be released in 1998:
Hypertexted version of the Road Technical Manual
Layered Elastic Design for Airfields (LED)
Dynamic Cone Penetrometer (DCP)
Electronic Cone Penetrometer (ECP)
Precipitation Database (PRECIP)
Pavement Design for Seasonal Frost (PDSF) - calculates Limited Subgrade Frost Penetration (LSFP)

Program upgrades include:
AFD (Airfield Design) - Windows program that combines RAD and FAD
- Adding total frost penetration and Limited Subgrade Frost Penetration (LSFP)
- Adding design curves
- Adding stabilized layers
- Adding compaction requirements
- Adding save and print Feature
- Changing output to print on main screen

ROADS Upgrade - Windows program that combines RRD and FRD
- Adding calculations for Limited Subgrade Frost Penetration (LSFP)
- Adding overlays
- Adding sensitivity analysis for flexible pavement

UNSURF (Unsurfaced Airfield Design)
- Converting to Window
- Adding ability to input CBR values and have the program calculate thicknesses

MODBERG calculates total frost penetration - correcting stand alone program.

WORLDINDEX (now includes USINDEX)
- Updating U.S. data
- Fixing access to HELP

TRACK - changing program to calculate resilient modulus.

APE (Airfield Pavement Evaluation) & LEEP (Layered Elastic Evaluation Program) - Adding total frost penetration.

LEDROADS (Layered Elastic Design for Roads)
- Converting to Windows
- Adding vehicle information (physical dimensions, turning radii, axle loads and spacing, tire pressure, wheel overhang, road clearance)

Fact Sheet and DOCLOC (Document Locator) Internet - converting existing programs to On-line. Instead of downloading the programs from the homepage you will use them On-line. Saves you time and disk space. Also guarantees you are using the latest data.

Aircraft Characteristics - developing program for aircraft characteristics contained in ETL 1110-3-394 and Navy aircraft.

Culvert evaluates both circular pies and reinforced boxed culverts for minimum cover requirements under airfield pavements - converting to Windows.

Free PCASE Regional Workshops

At our 3rd PCASE Regional Workshop in Anchorage, Alaska we had students from the Alaska District, Ft. Richardson DPW and Elemendorf AFB. The 4th Workshop was held at the Baltimore District. We had students from Baltimore, Norfolk and Philadelphia Districts. These Workshops were different from the previous workshops in that most of the students were interested in road design versus the more popular airfield design programs. Our new road program got a thorough and intense work out. The new Windows version of the programs were well received and good comments were made on how to further enhance the programs. Many questions were asked not only about the programs but about the design procedure.

These Workshops are as much a learning tool for the instructors/programmers as they are for the students. Instructors have learned more about design procedures around the country in this past year than in the many years spent designing roads and airfields. The programmers are also gaining a wealth of information from the users, on what the users needs are, as well as finding "bugs" in the programs.

It was unanimous from the students that the Workshops are beneficial and the students recommend it to others. A comment from a student, "Very much appreciate this course being brought to Alaska and at no fee. With the future outlook of our funds, our training budget Provides hands-on training will be nil. This is the only type of training we will be able to do."

The 2 day Workshop provides hands-on training for the PCASE computer programs. To host a PCASE workshop you need only to provide a room, screen, and a computer (with Windows 95 or NT) for every 2 students. We'll load your computers up with the latest versions of the PCASE programs. Best of all it's free!

FREE WORKSHOP

We are currently setting up locations for PCASE Workshops for 1998. If you're interested in hosting a workshop or you would like to know when there is one coming to your area contact Mary Adolf, (402) 221-7265 or E-mail: mary.j.adolf@usace.army.mil.

Testing for the C-17

In support of the Air Force, the USAE Waterways Experiment Station is currently determining the impact of the C-17 on contingency airfields and also verifying criteria for designing unsurfaced airfield pavements to support the aircraft. The C-17, touted as being the most advanced military airlift aircraft in the world, is designed to operate on short, austere airfields.

The unique C-17 gear configuration (six tires with the two inside tires slightly ahead of the other four tires) made it necessary to verify the extrapolation of existing criteria for the design of pavements to support the aircraft. To verify the structural airfield requirements, WES constructed a full scale pavement and trafficked it to failure. In addition to the laboratory study, WES conducted field surveys to evaluate the impact of C-17 operations on select airfields and the impact of the airfield roughness on the aircraft. Material parameters (strength, moisture content, material types), unsurfaced pavement performance (rutting and cross section), and longitudinal profiles were measured before, between and after operations of the C-17. The airfield performance provides input to the structural model. The roughness measurements provide a means of relating the airfield profile to the loads imposed on the aircraft. When loads become critical, the airfield will require maintenance and/or reconstruction to provide the smoothness required to safely operate the aircraft.

Currently CEWES is evaluating the data to determine its impact on current criteria and developing a procedure for evaluating an airfield intending to support the C-17 aircraft. For more information contact Bill Grogan, Waterways Experiment Station, (601) 634-2226.

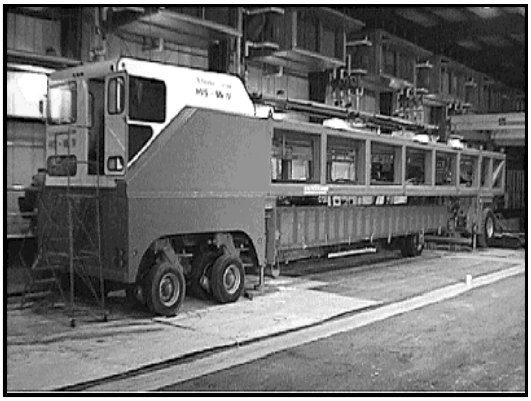
Minimizing Road Damage: A Multi-Partner Cooperative Demonstration Project at CRREL

Major highways are designed to withstand high volumes of traffic year round. However, low volume roads are highly susceptible to damage from trafficking during spring thaw. To prevent road damage, states, counties, and Federal agencies typically post load restriction signs. However companies whose livelihood depends upon trucking can suffer major losses while waiting for thawing roads to recover and load restriction signs to be removed. The construction industry cannot afford to curtail operations during spring thaw, nor can military operations come to a halt because of thaw-weakened conditions.

Using the COE mechanistic pavement design procedure for seasonal frost areas, the Cold Regions Research and Engineering Laboratory (CRREL) recently showed that reducing truck tire pressures during seasonal thaw could significantly decrease damage to thin asphalt pavements thereby increasing pavement life. Preliminary computer modeling further indicates a threshold tire pressure under which only minimal damage occurs — even during spring thaw.

In response to promising computer simulation results, several US and Canadian Departments of Transportation, private timber companies, and Federal Agencies have pooled funds, constructed instrumented pavement test sections, and are about to conduct a cooperative demonstration project in CRREL's Frost Effects Research Facility, an accelerated geotechnical testing center, in Hanover, NH. With further research using a full scale model, partners aim to quantify what many industries and local government already know but were unable to act upon without solid numbers.

Test sections will be frozen, then trafficked through thawing using high, medium, and low tire pressure. Traffic will be applied using CRREL's 1.8 million dollar,75 ft long, 50 ton heavy vehicle simulator (HVS) — an accelerated pavement testing device that that can apply up to 14,000 vehicle passes in one direction (or 28,000 in both direction) daily. The HVS can simulate up to 20 years of equivalent trafficking in just months! In addition to validating the seasonal pavement design procedure, it is anticipated that results from this demonstration project could affect load restriction guidelines which, in turn, would affect local economy of industries in seasonal frost areas.



Heavy Vehicle Simulator (HVS)

Current partners (Alaska Department of Transportation and Public Facilities, Minnesota Department of Transportation / Local Roads Program, the USDA Forest Service, Saskatchewan Highways and Transportation, Alberta Pacific, and Weyerhaeuser Canada) have pooled funding to complete one cycle of testing. The total number of test cycles (under varying conditions) will be determined by additional contributions from current and new partners during the first few months of 1998. If your agency is interested in more information or partnering in this demonstration project, please contact Maureen A. Kestler, Cold Regions Research and Engineering Laboratory, (603) 646-4215, Fax (603) 646-4640, E-mail: mkestler@crrel.usace.army.mil. There is a Cooperative Demonstration Project Web Page at http://www.crrel.usace.army.mil/vtp.

Criteria on the Net

Do you find yourself looking for Criteria Documents such as Technical Manuals, Engineering Technical Letters, Regulations, Guide Specifications, etc., etc., etc.? If you have access to the Internet, then we have good news for you. The National Institute of Building Sciences (NIBS) maintains this information in the Construction Criteria Base (CCB) library. The CCB library is available on the Internet at "http://www.ccb.org/" and on a set of 7 Compact Disks.

There is even better news if you are a Department of Defense (DOD) agency or a DOD Contractor. You may be eligible to receive your copy of CCB and/or Internet access FREE. If you're not eligible for free access, the price is a mere $250 per year. For more information about getting access to the CCB Library, check out the web site above or contact the NIBS office at (202) 289-7800.

The CCB Library is a very useful asset. It is updated quarterly so it has the latest information. If you don't already have access to this resource, maybe its time you did.

Need A Hard Copy Of A Corps Publication?

For Engineering Manuals (EM), Engineering Technical Letters (ETL), etc. contact the Corps of Engineers Publication Depot. Requests must be in writing via FAX (301) 394-0084 or mail: USACE, 2803 52nd Ave, Hyattsville, MD 20781-1102. Include the publication number and where to ship the publication. This service is available to Corps personnel and Contractors. For inquiries call (301) 394-0081 (they will not take orders over the phone).

For Technical Manuals (TM) contact the Army Publication Distribution Center, (314) 263-7305.

New Engineering Technical Letters (ETLs)

Design Curves

During the past several years the four classes of Army airfield/heliport pavements referenced in TM 5-803-4, Planning of Army Aviation Facilities, have been revised and expanded into six classes. The change in classes necessitated the development of new Army pavement design curves as provided in ETL 1110-3-486, Army Airfield/Heliport Pavement Design, dated 3 Nov 97. The new design curves are included in the PCASE airfield pavement computer design programs. The six classes are defined in TM 5-825-1, General Provisions for Airfield/Heliport Pavement Design. For more information contact Gainard Mattke, Transportation Systems Center, (402) 221-7263.

Use of Petroleum Contaminated Soil in Cold-Mix Asphalt Stabilized Base Course

The new ETL, Use of Petroleum Contaminated Soil in Cold-Mix Asphalt Stabilized Base Course is expected to be released in January 1998. The ETL provides guidance and design recommendations for the use of petroleum contaminated soil for cold-mix asphalt stabilized base course, referred to as ASB, construction. ASB should only be utilized when laboratory analysis has shown that the process will result in a material that will meet existing state and federal requirements for leachate.

Contaminated soil has been used successfully by the U.S. Army Corps of Engineers to construct cold-mix asphalt base course at Eielson AFB in Alaska. The main parameters governing the use of a contaminated soil are the type of petroleum contaminant and the amount or degree of contamination. The type of contaminant can affect the type of asphalt cement that is added to the ASB material. Exact limits on the amount of contaminant that can be used are not well defined and would generally vary with the type of soil and will affect the amount that can be used in the overall ASB mixture. Leachate tests on various formulations that also provide the desired mixture strength and durability properties will provide definitive answers in regards to the allowable levels of contaminated soil in the ASB mixture. For more information contact Jim Shoenberger, Waterways Experiment Station, (601) 634-3553.

Design And Construction Management Practices For Concrete Pavements

The ETL, Design And Construction Management Practices For Concrete Pavements, is scheduled for release in February 1998. This ETL provides guidance for managing the design and construction of concrete pavements, including airfield pavements, roads, streets, parking areas, vehicle and tank hardstands, tank trails and similar transportation surfaces.

Due to declining numbers of personnel trained and experienced in concrete paving design and construction practices, additional guidance is necessary to assist those involved in managing those activities. In addition, using activities are citing recent experience with some less than expected performance from concrete pavements. Using activities are calling on all, including the Corps, to improve concrete pavement performance. For more information contact John Hess, Sacramento District, (916) 557-7625.

On the Right TRACK...

With help of the TRACK computer program developed by Construction Engineering Research Laboratory (CERL) and the ingenuity of John Bowen of the Blue Grass Army Depot, approximately $4 million in railroad track repairs was saved. By inputting different loadings and speeds on the track into the TRACK program, Mr. Bowen found that 115-pound rail was well within the limitations for stress. By playing further with the TRACK program he found that the less expensive 100-pound rail would be strong enough to support his traffic in many cases.

TRACK is a computer tool that evaluates a railroad track's structural condition. Using Windows-based pull-down menus, the program provides valuable insight into a track's current load carrying capacity. It then allows a comparison of various rehabilitation options based on how, and to what extent they would improve the load carrying capacity.

Savings also came through identifying unused stockpiles of 100-pound rail at both active installations and some closing under the Base Realignment and Closure He also found supplies at Navy, Air Force, and NASA sites. The Army Depot got the rail for the cost of transporting it.

You can download TRACK from the Internet at the PCASE homepage at http://pavement.wes.army.mil/pcase.html. For more information about the program contact Don Plotkin, CECER, (217) 373-6749 or (800) USA-CERL, ext. 6749, e-mail: d-plotkin@cecer.army.mil.

Army Railroad Track Standards and Maintenance Courses Available

There two Army Railroad Track Standards and Maintenance Training Courses being offered. Both courses serve to meet the railroad track inspector requirements for certification under Army Regulation (AR) 420-72. The basic course is a prerequisite to the U.S. Army Railroad Track Inspector Certification Exam; the advanced course is a requirement for recertification. The registration deadline for the basic course is 10 February 1998; for the advanced course, 14 April 1998.

The U.S. Army Railroad Basic Track Standards and Maintenance Training Course will be conducted at the USAE Waterways Experiment Station, Vicksburg, Mississippi, 24 February to 5 March 1998. The course presents the Army railroad track maintenance standards along with methods by which maintenance can be performed to correct deficiencies. Includes two sessions of field work, an introductory field trip and track and turnout inspections.

The U.S. Army Railroad Advanced Track Standards and Maintenance Training will be conducted at McAlester Army Ammunition Plant (MCAAP), McAlester, Oklahoma, 28 April through 7 May 1998. This course includes classroom and field instructions. The field work will include hands-on training for correcting track deficiencies along with demonstrations of the automated track maintenance equipment by the MCAAP railroad repair crew.

For more information contact Dick Grau, CEWES, (601) 634-2494, or Jim Routson, USACPW, (703) 806-5995.

Railroad Details

With the help of the Omaha District Design Branch, the Transportation Systems Center has developed standard details typically used for railroad projects: number 8, 9 and 10 turnouts, tie plates, spiking patterns, typical track sections, road crossings and railroad signage. The details are available on the PCASE Internet Home Page: http://pavement.wes.army.mil/pcase.html. The details are provided with the intent of saving Districts CADD time. The use of these details is optional. Recommendation for improvements can be provided to Dan Boyer, (402) 221-7265, e-mail dan.j.boyer@usace.army.mil. The Technical Manual 5-850-2, Railroad Design and Rehabilitation, is now available on the Construction Criteria Base (CCB) at http://www.nibs.org/ccb.

Searching for an E-Mail Address?

If you are looking for an E-mail address for a Corps employee, the Electronic Mail Center of Expertise now has a homepage (http://eml01.usace.army.mil) that does the searching for you. If you know the person's name (full name not required), office symbol or phone number the homepage will search it's database and give you the list of all the data similar to the field it's searching. You click on the person you want and it will give you the e-mail address. It's slick!

www.internet.addresses

Corps-wide Centers of Expertise
http://www.usace.army.mil/inet/functions/cw/cecwe/coexpert/centers.htm
Developed by Corp's Headquarters, this site lists Mandatory Centers of Expertise (MCX), Technical Centers of Expertise (TSC), Centers of Standardization (COS) and Support Centers (SC). The **Transportation Systems Center** mandatory services, description, roles and responsibilities are defined at: http://www.usace.army.mil/inet/functions/cw/cecwe/coexpert/newcoe/mcx/tsc/tsc.htm. Also provides a link to the TSMCX homepage.

USACE Points of Contact Directory for Programming Documents (1391s)
http://www.hq.usace.army.mil/cemp/e/et/1391pocs.htm
Headquarter proponents and their areas of expertise and Points of Contact at Technical Centers of Expertise.

CADD-GIS Technology Center at the Waterways Experiment Station
http://tsc.wes.army.mil
Site provides information on training, meetings, workshops, and current events.

Roads & Bridges
http://www.roadsbridges.com
Guide to the latest transportation or construction related equipment, supplies, technology, and services.

Construction-Services Directory
http://www.constructionnet.net
Online directory for information companies doing business in the construction industry.

Construction Supernetwork
http://www.supernetwork.net
Interactive community for the concrete and masonry industries.

National Engineers Week
http://www.eweek.org
What's new for 1998 E-Week, engineering survey, scheduled events, Mister "E", etc.

Year 2000 Information Directory
http://www.itpolicy.gsa.gov/mks/yr2000/y201toc1.htm
Assists Federal government and other interested organizations in addressing the Year 2000 conversion.

Army Civilian Personnel On-Line
http://www.cpol.army.mil
HQDA catalog of civilian training, education and professional development opportunities.

Calendar of Events

National Pavement Maintenance Exposition
Nashville, Tennessee
11-14 February 1998
(800) 547-7377, FAX (414) 563-1699

Case Histories in Geotechnical Engineering
St. Louis, Missouri
8-15 March 1998
Continuing Education, University of Missouri-Rolla, 103 ME Annex, Rolla, MO 65409-1560, FAX (573) 341-4992

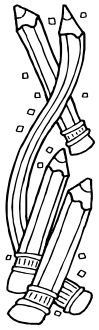
Ports '98
ASCE's Specialty Conference
Long Beach, California
8-11 March 1998
(800) 548-2723

6th International Conference on Geosynthetics
Atlanta, Georgia
25-29 March 1998
(612) 222-2508, FAX (612) 222-8215
e-mail: ifaidan@aol.com
web site: www.ifai.com

American Concrete Institute (ACI)
Houston, Texas
29 March - 3 April 1998
(810) 848-3795, FAX (810) 848-3796

Superpave: Today and Tomorrow
St. Louis, Missouri
21-23 April 1998
POC: Mandee Hall (606) 288-4964

4th International Conference on Managing Pavements
Durban, South Africa
17-22 May 1998
011-27-12-63 1680, FAX 011-27-12-63 1681
e-mail: viss at@fanella.ee.up.ac.za



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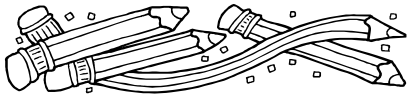
Fax this page to Mary Adolf, Transportation Systems Center, FAX (402) 221-7261.



Transportation News

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If you have any questions on transportation systems, let us hear from you.

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Homepage
http://www.mrd.usace.army.mil/tsmcx/tsmcx.html

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